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UNITED STATES  
DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Economics

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**HANDBOOK *of***  
**UNITED STATES**  
**STANDARDS**  
***for* BEANS**

EFFECTIVE SEPTEMBER 1, 1926



UNITED STATES  
GOVERNMENT PRINTING OFFICE  
WASHINGTON

1927



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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF AGRICULTURAL ECONOMICS.

The following standards for use in the grading and marketing of beans are recommended by the Bureau of Agricultural Economics, United States Department of Agriculture. These standards are the result of studies and investigations of all phases of the bean industry and of suggestions received from persons experienced in the production, marketing, and grading of this commodity. Their adoption and use by all agencies engaged in handling beans should promote uniform grading and should facilitate the marketing of this commodity.

LLOYD S. TENNY,  
*Chief of Bureau.*

# U. S. STANDARDS FOR BEANS

## DEFINITIONS

For the purposes of the United States standards for beans:

**Beans** shall be all beans of the kinds produced in the continental United States commonly sold in the dry threshed state and used for edible purposes, as defined in these standards and which contain not to exceed 5 per cent of foreign material.

**Basis of determinations.**—All determinations of factors entering into the grading of a lot of beans shall be made upon the basis of a representative sample drawn in accordance with methods approved by the Chief of the Bureau of Agricultural Economics.

**Percentages**, except in the case of moisture, shall be percentages ascertained by weight.

**Percentage of moisture** shall be that ascertained by the moisture tester and the method of use thereof described in Department Bulletin No. 1375, issued by the United States Department of Agriculture, Bureau of Agricultural Economics, or that ascertained by any device and method giving equivalent results.

**Other beans** shall be all beans other than the kind designated in the class of the lot being graded, and shall include seed garden beans or other dry edible beans not defined in these standards.

**Splits** shall be beans which are split or broken, including beans the halves of which are held together loosely and pieces up to three-fourths the size of whole beans, but not including beans with only cracked or checked skins.

**Damage** shall be beans which are so badly injured or discolored by weather, frost, heat, insects, disease, or other causes as to seriously affect the appearance and quality of the sample.



**Foreign material** shall be all matter other than beans but shall not include seed garden beans and other dry edible beans not defined in these standards.

**Stones** shall be rocks, stones, pebbles, shale, other concreted earthy or mineral matter, or other substances of similar composition and hardness that do not disintegrate in water.

**Blistered beans** shall be beans of classes Lima and Baby Lima showing a bursting or abrasion of the skin, sometimes resulting in a spreading apart of the bean.

**Wrinkled beans** shall be beans of classes Lima and Baby Lima which have deeply wrinkled skins and which are badly warped or misshapen.

**Well screened**, as applied to the general appearance of beans, shall mean that the beans are free from such small, shriveled, undeveloped, split and broken beans and foreign material as can be removed readily in the ordinary processes of milling or screening.

**Good natural color**, as applied to the general appearance of beans, shall mean that the beans possess the color and appearance of new crop beans grown, harvested, threshed, and prepared for market under normal conditions prevailing in the principal region of production of such beans.

**Weevily beans** shall be beans which are infested with weevils or other insects injurious to stored beans or which contain beans that have been damaged by such weevils or insects.

**Grade designation.**—The grade designation of any lot of beans shall include successively the letters “U. S.,” the numerical number of the grade or the words “Sample Grade,” as the case may be, and the name of the class.

**Federal food and drugs act.**—Nothing herein shall be construed as authorizing the shipment of beans in violation of the Federal food and drugs act.

**PEA BEANS (CLASS I)**

This class shall include all white beans of the type grown in the Great Lakes region commonly known as Navy or Pea beans.

## Grade requirements for Pea beans

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material		
		Total	Other beans <sup>1</sup>	For- eign mate- rial
U. S. No. 1..	Well screened and of good natural color.	<i>Per cent</i> 1.5	<i>Per cent</i> 0.0	<i>Per cent</i> Tr. <sup>2</sup>
U. S. No. 2..	Well screened and may be slightly off color.	3.0	.1	0.1
U. S. No. 3..	May be of a poor color.....	5.0	.5	.5
U. S. Sample Grade.	Sample grade shall be beans of the class Pea beans which do not meet the requirements of any of the numerical grades applicable to this class or which contain over 17 per cent mois- ture, or have any commercially objectionable odor, or are heating, or weevily, or otherwise of distinctly low quality.			

<sup>1</sup> **Other beans.**—The percentage limits here give for other beans apply only to those beans that are *not* similar in color, size, and shape to Pea beans. An additional allowance of 3 per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of Pea beans.

<sup>2</sup> **Trace (Tr.)**, as applied to “foreign material” in grade No. 1 of the class Pea beans shall not exceed  $\frac{1}{100}$  of 1 per cent and shall not include any stones which can be detected by methods of sampling approved by the Chief of the Bureau of Agricultural Economics.

**RED KIDNEY BEANS (CLASS II)**

This class shall include all beans of a light red or brown color of the type commonly known as Red Kidney.

**DARK RED KIDNEY BEANS (CLASS III)**

This class shall include all beans of a dark red or mahogany color of the type commonly known as Dark Red Kidney.

# Grade requirements for Red Kidney and Dark Red Kidney beans

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material		
		Total	Other beans <sup>1</sup>	For- eign mate- rial
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1--	Well screened and of good natural color.	2.0	0.0	Tr. <sup>2</sup>
U. S. No. 2--	Well screened and may be slightly off color.	4.0	.2	0.2
U. S. No. 3--	May be of a poor color-----	6.0	.5	.5
U. S. Sample Grade.	Sample grade shall be beans of the classes Red Kidney and Dark Red Kidney which do not meet the requirements of any of the numerical grades applicable to these classes or which contain over 17 per cent moisture, or have any commercially objectionable odor, or are heating, or weevily, or otherwise of distinctly low quality.			

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to that of the class being graded. An additional allowance of 3 per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of the beans in the class being graded. This allowance shall apply also to so-called “Sports” commonly found in Red Kidney and Dark Red Kidney beans.

<sup>2</sup> **Trace (Tr.)**, as applied to “foreign material” in grade No. 1 of the classes Red Kidney and Dark Red Kidney beans shall not exceed  $\frac{1}{100}$  of 1 per cent and shall not include any stones which can be detected by methods of sampling approved by the Chief of the Bureau of Agricultural Economics.

**WHITE KIDNEY BEANS (CLASS IV)**

This class shall include all beans of the type commonly known as White Kidney.

**MEDIUM WHITE BEANS (CLASS V)**

This class shall include all white beans of the type grown in the Great Lakes region commonly known as Medium or Medium White.

**MARROW BEANS (CLASS VI)**

This class shall include all white beans of the type commonly known as Marrow.

**YELLOW EYE BEANS (CLASS VII)**

This class shall include all beans of the type commonly known as Yelloweye.

**BROWN SWEDISH BEANS (CLASS VIII)**

This class shall include all brown beans of the type commonly known as Brown Swedish.

**Grade requirements for White Kidney, Medium White, Marrow, Yelloweye, and Brown Swedish beans**

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material		
		Total	Other beans <sup>1</sup>	For- eign mate- rial
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1...	Well screened and of good natural color.	2.0	0.1	0.1
U. S. No. 2...	Well screened and may be slightly off color.	4.0	.2	.2
U. S. No. 3...	May be of a poor color.....	6.0	.5	.5
U. S. Sample Grade.	Sample grade shall be beans of the classes White Kidney, Medium White, Marrow, Yelloweye, and Brown Swedish, which do not meet the requirements of any of the numerical grades applicable to these classes or which contain over 17 per cent moisture, or have any commercially objectionable odor, or are heating, or weevily, or otherwise of distinctly low quality.			

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to that of the class being graded. An additional allowance of 3 per cent, in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of the beans in the class being graded. In the class Yelloweye beans the total allowance of White beans of a size and shape similar to that of Yelloweyes may be 10 per cent in grade 1, 15 per cent in grade 2, and 20 per cent in grade 3.

**GREAT NORTHERN BEANS (CLASS IX)**

This class shall include all white beans of the type commonly known as Great Northern.



## Grade requirements for Great Northern beans

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material		
		Total	Other beans <sup>1</sup>	For- eign mate- rial
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1..	Well screened and of good natural color.	2.0	0.3	0.3
U. S. No. 2..	Well screened and may be slightly off color.	4.0	.6	.6
U. S. No. 3..	May be of a poor color.....	6.0	1.0	1.0
U. S. Sample Grade.	Sample grade shall be beans of the class Great Northern which do not meet the requirements of any of the numerical grades applicable to this class or which contain over 17 per cent moisture, or have any commercially objection- able odor, or are heating, or weevily, or other- wise of distinctly low quality.			

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to Great Northern beans. An additional allowance of 3 per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of Great Northern beans.

**PINTO BEANS (CLASS X)**

This class shall include all beans of the Mexican Pinto type but shall not include Spotted Red Mexican.

## Grade requirements for Pinto beans

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material.		
		Total	Other beans <sup>1</sup>	For- eign mate- rial
U. S. No. 1--	Well screened and of good natural color.	<i>P. ct.</i> 4.5	<i>P. ct.</i> 0.5	<i>P. ct.</i> 0.5
U. S. No. 2--	Well screened and may be slightly off color.	7.0	1.0	1.0
U. S. No. 3--	May be of a poor color-----	10.0	1.5	1.5
U. S. Sample Grade.	Sample grade shall be beans of the class Pinto beans which do not meet the requirements of any of the numerical grades applicable to this class or which contain over 17 per cent moisture or have any commercially objectionable odor, or are heating, or weevily, or otherwise of distinctly low quality.			

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to Pinto beans. An additional allowance of per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of Pinto beans.

**SMALL WHITE BEANS (CLASS XI)**

This class shall include all white beans of the type grown on the Pacific coast commonly known as Small White, but shall not include Tepary beans.

## Grade requirements for Small White beans

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material			
		Total	Damage	Other beans <sup>1</sup>	For- eign mate- rial
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1 _ _	Well screened and of good, natural color.	1.5	1.0	0.3	0.3
U. S. No. 2 _ _	Well screened and may be slightly off color.	3.0	2.0	.5	.5
U. S. No. 3 _ _	May be of a poor color.	5.0	3.0	1.0	1.0
U. S. Sample Grade.	Sample grade shall be beans of the class Small White beans which do not meet the require- ments of any of the numerical grades applicable to this class or which contain over 17 per cent moisture, or have any commercially objection- able odor, or are heating, or weevily, or other- wise of distinctly low quality.				

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to that of Small White beans. An additional allowance of 3 per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of Small White beans.

**LARGE WHITE BEANS (CLASS XII)**

This class shall include all white beans of the type grown on the Pacific coast commonly known as Large White beans.

**PINK BEANS (CLASS XIII)**

This class shall include all beans of the type commonly known as Pink or California Pink.

**CALIFORNIA RED BEANS (CLASS XIV)**

This class shall include all beans of the Red Mexican type commonly known as California Red.

**BAYO BEANS (CLASS XV)**

This class shall include all beans of a solid bay or chestnut color of the type commonly known as Bayos.

**CRANBERRY BEANS (CLASS XVI)**

This class shall include all beans of the type commonly known as Cranberry, Speckled Cranberry, and Horticultural Pole.

**BLACKEYE BEANS (CLASS XVII)**

This class shall include all cowpeas of the type grown on the Pacific coast commonly known as Blackeyes.

**Grade requirements for Large White, Pink, California Red,  
Bayo, Cranberry, and Blackeye beans**

Grade	General appearance	Maximum limits of Splits, Damage, other beans, and foreign material			
		Total	Damage	Other beans <sup>1</sup>	For- eign mate- rial
		<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1..	Well screened and of good natural color.	2.0	1.0	0.5	0.5
U. S. No. 2..	Well screened and may be slightly off color.	4.0	2.0	1.0	1.0
U. S. No. 3..	May be of a poor color.	6.0	3.0	1.5	1.5
U. S. Sample Grade.	Sample grade shall be beans of the classes Large White, Pink, California Red, Bayo, Cranberry, and Blackeye which do not meet the require- ments of any of the numerical grades applica- ble to these classes or which contain over 17 per cent moisture, or have any commercially objection- able odor, or are heating, or weevily, or other- wise of distinctly low quality.				

<sup>1</sup> **Other beans.**—The percentage limits here given for other beans apply only to those beans that are *not* similar in color, size, and shape to that of the class being graded. An additional allowance for 3 per cent in grade 1, 5 per cent in grade 2, and 8 per cent in grade 3 shall be made for “other beans” that are similar in color, size, and shape to that of the beans of the class being graded.

**LIMA BEANS (CLASS XVIII)**

This class shall include all large white Lima beans of the Large White Pole and Burpee Bush Lima type.

**BABY LIMA BEANS (CLASS XIX)**

This class shall include all small white Lima beans of the Henderson bush and similar types commonly known as Baby Lima.



Grade requirements <sup>1</sup> for Lima <sup>2</sup> and Baby Lima beans

Grade	Blistered and wrinkled beans	Skinned and broken beans	Splits	Damaged beans and foreign material				
				Total	Worm damage	Other damage	Foreign material <sup>3</sup>	
							Total	Stones
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
U. S. No. 1-----	2.5	2.5	2.0	1.0	0.5	0.5	0.3	0.1
U. S. No. 2-----	5.0	5.0	3.0	2.0	1.0	1.0	.5	.2
U. S. Sample Grade.	Sample grade shall be beans of the classes Lima and Baby Lima, which do not meet the requirements for any of the numerical grades applicable to these classes or which contain over 17 per cent moisture, or have any commercially objectionable odor, or are heating, or weevily, or otherwise of distinctly low quality.							

<sup>1</sup> **General appearance.**—Lima beans and Baby Lima beans of the grade U. S. No. 1 shall be well screened and of good natural color. Lima beans and Baby Lima beans of the grade U. S. No. 2 shall be well screened and may be slightly off color.

<sup>2</sup> **Size requirements.**—No. 1 Lima beans shall be of a size such that not more than 40 per cent will pass through a  $\frac{3}{8}$ -inch round hole screen. No. 2 Lima beans shall be of a size such that not more than 10 per cent will pass through a  $\frac{2}{4}$ -inch round hole screen and not more than 45 per cent through a  $\frac{2}{8}$ -inch round hole screen.

<sup>3</sup> U. S. No. 2 Baby Lima beans may contain not more than 1 per cent of foreign material, provided the total of damaged beans and foreign material does not exceed 2.0 per cent.

## IMPORTANT FEATURES OF UNITED STATES BEAN STANDARDS

### CLASS DESIGNATIONS

In the various commercial standards used in the past a class is provided for each distinct type of bean. These are natural commercial classes and in the main they are retained in the United States standards. Some of the class designations have been clarified in order to bring about a more definite idea of the meaning of the various terms.

The terms "Pea beans" and "Small White" are retained for the purpose of keeping separate and distinct in the system of grades the white pea beans of the type grown in the Great Lakes region from the small white beans of the type grown on the Pacific coast. It is essential that these two classes of beans be kept distinct because different methods of preparing them for market make it impractical to fix the same factor limits in comparable grades and because of the discriminating demand for each from two respective groups of commercial consumers. Emphasizing this distinction also helps to get away from the term "Navy" which has been applied indiscriminately to these and possibly other classes.

### CLASS GROUPING FOR PURPOSES OF GRADING

Because of varying conditions of production, methods of preparation for market, and requirements of consumers, the same factor limits and grouping can not be applied in grading all classes of beans. Hence the various classes are grouped under appropriate grading schemes. With the classes Pea beans, Great Northern, Pinto, and Small White, separate grades are provided for each, while the classes in each of the following groups are graded under the same respective requirements: Red Kidney and

Dark Red Kidney; White Kidney, Medium White, Marrow, Yelloweye, and Brown Swedish; Large White, Pink, California Red, Bayo, Cranberry, and Blackeye; and Lima and Baby Lima.

There is only a slight difference between the requirements of comparable grades of some of these groups. For example, the Red Kidney and Dark Red Kidney grades differ from White Kidney, Marrow, etc., only in more rigid requirements as to "other beans" and "foreign material" in the No. 1 grade. This difference may appear insignificant but it is justified on the grounds of consumers' demands. Similar variations occur in comparable grades for other groups or classes to meet the requirements of peculiar conditions of production, preparation for market, or consumption.

### GRADE DESIGNATIONS

Uniformity in grade designations in a set of standards is much to be desired. It is illogical, if not confusing, for the top grade of one class or group of classes of beans to be known by one designation and that of another class or group by an entirely different name. For the most part commercial grade designations have reflected the methods of preparing the beans for market. In many cases the grade may be attained by means other than that implied by the grade designation. The method of reaching a grade means less to the buyer than the assurance that a given lot of beans meets the requirements of the grade desired.

It is the policy of the department to apply as far as possible and practicable numerical designations to grades for all commodities. When the top grade in each class of a commodity is designated "No. 1," the second grade "No. 2," etc., there is no question as to the relative

quality. There must of necessity be some variation in the quality of the top grade of different classes of beans, because of peculiar local problems of production and preparation for market, but with the top grade for all classes designated "No. 1" the idea is conveyed more clearly that it represents the highest quality in any given class or at least the highest quality generally available commercially.

In the United States standards for beans each class is divided into three numerical grades, designated U. S. No. 1, U. S. No. 2, and U. S. No. 3, except the classes Lima and Baby Lima, for which there are two numerical grades, U. S. No. 1 and U. S. No. 2. These numerical grades define the relative quality of beans in a given class. The quality or grade is measured by the percentage of certain defects present in the beans, and the maximum percentage of such defects permitted in each of the numerical grades is determined by the nature or type of bean, conditions under which it is produced, methods of preparing for market and the requirements of consumers.

The numerical grades cover the range of quality normally found in the respective classes of beans to which they are applicable. A sample grade is provided for beans of each class which for any reason do not meet the requirements of any of the numerical grades in such class.

### GRADE FACTORS

The grade of beans depends on their wholesomeness for food, as evidenced by their general appearance and degree of freedom from moisture and such defects as split beans, damaged beans, foreign material of any nature, and mixtures of other kinds or classes of beans. Equitable standards are constructed so as to give proper weight to each factor in proportion to its effect on the commercial value of the product and the difficulties attending its elimination.



**General appearance.**—In grading beans the general appearance is considered both as to bright or natural color and uniformity of size. The more closely beans of a given class approach the natural color applicable to that class the less the quality is affected by this factor. The color is affected by weather conditions, age, and other causes. This factor is considered only when a lot of beans contains a sufficiently large percentage of such off-colored or slightly stained beans to affect seriously its appearance. The construction of the standards is such that in the large majority of cases this factor does not operate to lower the grade.

Absolute uniformity in size is neither necessary nor practicable, but the presence of shriveled, undersized, and immature or undeveloped beans gives an uneven appearance to a sample and indicates that it has not been submitted to ordinary cleaning and screening operations. The term "well screened" as applied to the general appearance of beans describes in a general way the practical limits of uniformity in size. Definite screen sizes are fixed for Limas and Baby Limas but not for the other classes.

**Moisture.**—The maximum moisture content has been fixed at 17 per cent for each of the numerical grades in all classes. This limit is based on the experience and observation of the trade over a period of years supplemented by preliminary investigations of the Bureau of Agricultural Economics. With the limit placed at 17 per cent moisture is rarely the grade-determining factor. Under certain favorable storage conditions, a higher percentage of moisture may be safe. Storage conditions, however, are not constant and beans are shipped from one section to another with varying climatic conditions. For these reasons it is desirable that the maximum allowance of moisture be within the safety limit.

**Splits.**—In itself a split bean may be wholesome food, but when mixed with sound whole beans it destroys their uniform appearance and

cooking qualities. It is also more susceptible to damage and deterioration than is a whole bean. Existing methods of cleaning easily reduce this factor to a negligible quantity in most cases and it is not necessary to provide for heavy allowances in grading. In the construction of the United States standards this factor is allowed to play within the limits of "total splits, damage, other beans, and foreign material" permitted in each of the grades, except in Lima and Baby Lima, where special limits are provided.

**Damage.**—The chief causes of damage in beans are weather, frost, disease, insect, or a combination of two or more of these. The type of damage is not so important as the degree to which it affects the commercial value of the beans. Much of the damage is only surface discoloration, but the effect of this discoloration on the appearance and commercial quality of beans may be as great as seemingly more serious types of damage.

The practical application of this factor is complicated by the various degrees of damage which makes it difficult to distinguish between a damaged and a sound bean. The degree of damage within the various types is evidenced by certain outward characteristics which can be consistently identified. This eliminates largely the human element and seasonal variations which otherwise influence the interpretation of damage and the resulting grade. These outward characteristics are difficult to describe and their identification is made positive only by supplementing their description with type samples. Once these types are clearly fixed in mind they may be correctly interpreted and the proper grade applied.

Damage is a more important grade factor than some others because of its greater effect on quality and the difficulty of removal. The allowance for this factor is kept down to a minimum and at the same time is sufficiently broad so that the percentage of damage may

be reduced by practical methods to within the limits required for a given grade. As is the case with splits, this factor may equal the maximum "total splits, damage, other beans, and foreign material" permitted in the grades in the absence of other factors, except where special limits are placed on it.

**Other beans.**—Mixed beans as such rarely, if ever, appear on the market. Slight mixtures sometimes occur, however, and the quality or grade of the beans is affected thereby. The latter is especially true of beans of widely different types. Fortunately mixing can be prevented by the proper selection of seed and reasonable care in the preparation of beans for market. Hence it is practicable in most cases to keep the allowance of other beans in the grades very low. Beans of different classes which are similar in color, size, and shape are not so objectionable as those of contrasting types. Because of this fact and because beans of this type appear more often in mixtures and are more difficult to remove, a greater allowance for them is permitted.

**Foreign material.**—Foreign material is easily removed by present-day cleaning machinery and for this reason the allowances are kept within very narrow limits. The most common types of foreign material in commercial lots of beans are adobe and stones. Chaff, straw, weed seeds, etc., also occur in beans but only in thresher-run or pickage stock. Adobe and stones are more prevalent in beans grown in the Rocky Mountain and Pacific Coast States because of the nature of the soil and methods of harvesting and preparing for market. These conditions are more or less fixed. Grades for beans grown in these areas, therefore, must provide for somewhat more liberal allowances of foreign material than are necessary for beans grown in the more eastern States, where hand-picking is generally practiced.

## APPLICATION OF U. S. BEAN STANDARDS

In the application of the U. S. Standards the grade of a lot of beans may be affected by a single factor. A lot of Pea beans, for example, may meet the requirements of the U. S. No. 2 grade as to general appearance and moisture and contain not over 3 per cent "total splits, damage, other beans, and foreign material," but would be graded U. S. No. 3 because it contained more than one-tenth of 1 per cent foreign material within this total. Another lot of Pea beans might meet the requirements of the U. S. No. 2 grade as to general appearance, moisture, other beans, and foreign material, and be graded U. S. No. 3 on account of containing over 3 per cent "total splits, damage, other beans, and foreign material." In making inspections where the grade is below U. S. No. 1 the factor determining the grade will be shown on the certificate together with such other factors as may be requested or seem desirable, as: U. S. No. 3 Pea beans (account of 0.4 per cent foreign material); U. S. sample grade Pinto beans (account of 18 per cent moisture); U. S. No. 2 Great Northern beans (account of 3 per cent total splits, damage, other beans, and foreign material).

Where no special limits are placed on splits or damage the total percentage allowed for these factors, in which is included the special limits on "other beans" and "foreign material," may be made up of either splits or damage alone or of any combination of the two. For example, a lot of Great Northern beans grading U. S. No. 1 may contain 2 per cent total splits and damage, including 0.3 per cent "other beans" and 0.3 per cent "foreign material." If "other beans" and "foreign material" each is present to the extent of the limit of 0.3 per cent allowed the remaining 1.4 per cent may be made up of "splits" and "damage" in any combination. Any reduction in the percentage



present of "other beans" and "foreign material" permits a corresponding increase in the percentage of splits and damage without affecting the grade.

In the grade requirements for the classes Small White, Large White, Pink, California Red, Bayo, Cranberry, and Blackeye, special limits are placed on "damage" as well as on "other beans" and "foreign material" and an excess of this factor alone will operate in the same manner to affect the grade. Special limits also are placed on splits and other factors in the numerical grades for classes Lima and Baby Lima. The standards are so constructed and all factor limits so fixed as to make either "damage" or "total, splits, damage, other beans, and foreign material" the grade-determining factor in practically all cases.

## FEDERAL BEAN INSPECTION SERVICE

Federal bean inspection is authorized by a clause in the annual appropriation act for the Department of Agriculture. The general plan for conducting this service provides for the employment of Federal bean inspectors at shipping points and at important terminal markets under cooperative agreements between the Bureau of Agricultural Economics and organizations such as State departments of agriculture, commercial exchanges, and dealers' or growers' associations. Under these agreements, persons who possess the necessary qualifications are trained and licensed as Federal bean inspectors and their work is supervised by the bureau during the life of the license. The organization cooperating with the bureau pays the inspector for his work and pays all local expenses (such as office rent) necessary to the proper conduct of the work. The organization cooperating with the bureau usually collects the fees charged for inspections made under agreements of this kind. The funds obtained in this way are divided

between the local organization and the United States Department of Agriculture in such a manner that both are recompensed as nearly as possible for the expense incurred by them in the conduct of the service.

The work of the local inspector is supervised by bean standardization specialists of the United States Department of Agriculture and by supervising inspectors located at central points in the large bean producing and consuming areas. The supervising inspectors not only assist in supervising the work of the local inspectors but also are available for the purpose of making inspections at points in their territory where no other inspectors can be obtained, and of assisting producers, shippers, and consumers in obtaining all benefit possible from the U. S. Standards for Beans and the Federal bean-inspection service.

If there is sufficient demand for inspection at any place to pay the expense of having an inspector, but no available organization is prepared to cooperate with the bureau in employing an inspector, the bureau may locate an inspector at that place who is a full-time Government employee or may arrange to furnish the service in another way that may appear desirable. Inspectors located at any shipping point or terminal market usually are available for making inspections at neighboring points. The location of an inspector at any point does not imply obligation on the part of shippers or receivers to have their beans inspected. The inspector's services are available only upon request of one of the parties financially interested in a lot of beans.

Persons interested in having a Federal bean inspector located at any point should write the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C. Communications of this nature should outline as fully as possible the situation at the point where inspection is desired, including the name of any State or local organization with

whom the bureau might cooperate in establishing the service, and the probable number of inspections which would be made annually.

**Federal-State inspection.**—Where the service is established in cooperation with a State agency, such as the State department of agriculture, the inspectors usually are Federal-State inspectors. Certificates issued by such inspectors are Federal-State certificates and are supported by the authority of the State as well as the Federal Government. In most cases these certificates are *prima facie* evidence of the facts contained in State courts as well as in Federal courts.

**Qualifications of inspectors.**—Before being granted a license as a Federal bean inspector an applicant is required to show that he has sufficient experience in grading and marketing beans or commodities of a similar nature to enable him to grasp readily the application of the United States standards. A Federal inspector may not have a financial interest, either directly or indirectly, in a business engaged in handling beans. The applicant's personal knowledge and experience is supplemented by the necessary training given by the Bureau of Agricultural Economics to insure accurate and consistent interpretation and application of the standards. This training consists largely of drills in the technique of inspection, in the identification of the classes of beans, in the interpretation of grade factors, and in the construction of the United States standards. After receiving a Federal license an inspector is required to send in to the Washington office, or to the supervising inspector's office in his district, portions of samples used as the basis for making inspections, properly identified. This gives the most effective check on the work of the individual inspector and promotes uniform and consistent application of the standards by all inspectors.

**Federal bean inspection certificates.**—Regulations of the Secretary of Agriculture governing the inspection of beans require an inspector to issue an inspection certificate for each lot of beans inspected in practically every case. The inspection certificate thus issued is evidence of the quality of the beans covered thereby expressed in terms of the United States standards. In addition to the U. S. Class and Grade an inspector, upon request, may show on the certificate any commercial grade applicable to the class in accordance with the generally approved interpretation of the published description of such commercial grades. The law provides that all such certificates are receivable in all courts of the United States as *prima facie* evidence of the truth of the statements they contain. Several of the States also have similar laws making these certificates acceptable as *prima facie* evidence in their State courts.

All inspection certificates show the date on which the inspection was made and the quantity of beans in the lot inspected, together with the identification and location of the beans at the time of inspection. Following these items are given the class and grade of the beans in the lot in terms of the United States standards. Notations regarding factors affecting the grade may follow the class and grade as already explained on page 28. If there are more than one class and grade of beans in the lot and these are separated, the approximate amount and class and grade of each portion is stated separately on the certificate, the largest quantity being named first. Statements regarding poor sacking, defects in cars in which the beans are loaded, and other similar information are placed below the class and grade.

**Methods of inspection.**—Inspections may be made either at original shipping points, in transit, or at terminal markets. Inspections are made on the basis of a representative sample drawn from the lot in accordance with methods



prescribed by the Chief of the Bureau of Agricultural Economics. Such samples must be drawn either by the Federal inspector who makes the inspection or by some person officially designated by the bureau, or by the co-operating organization, and approved by the bureau for this purpose. Certificates of grade issued in such cases cover the entire lot of beans represented by the sample.

If a lot of beans is located too far from an inspector's office to allow an official sample to be drawn, a sample of 2 pounds or more may be taken by anyone interested and submitted to the nearest inspector or to the Washington office for inspection. Such sample should be drawn in strict accordance with methods approved by the chief of the bureau as presented above. If moisture is suspected as being a grade-determining factor the sample should be placed in a moisture-proof container, in order that the resulting grade of the sample may represent more closely the true grade of the lot at the time the sample was taken. This is termed "sample inspection" and certificates of grade issued show the size of the sample submitted and state that the quality and condition is that of the sample only. The value of a certificate of this kind depends largely upon whether the sample is truly representative of the lot from which it was taken. In case a controversy is to be settled, parties should agree upon a representative sample for this purpose before sending it to an inspector.

**Method of sampling.**—The obtaining of a representative sample is essential to the determination of the true grade of a given lot of beans. If the sample obtained is not representative no amount of care in analyzing the sample will show the correct grade of the beans being inspected. To the end that a sample may be representative of the beans in the lot from which it is drawn the following method of sampling

is prescribed for inspectors licensed to inspect beans under the United States standards:

The sample drawn should be approximately 2 quarts or larger in size. If the time to elapse between the drawing of the sample and the determination of the grade would allow a change in the condition of the sample (such as loss of or accumulation of moisture) such as would affect the grade, at least  $1\frac{1}{8}$  pints should be drawn separately and placed in an air-tight container.

Samples should be drawn from at least 10 per cent of the individual bags, selected at random in a lot, and from as many more as, in the opinion of the inspector, may be necessary to obtain an average and representative sample.

In case a lot of beans is of such size or is stacked in such a manner that a representative sample can not be obtained, no official inspection should be made of the beans until the applicant makes representative portions thereof accessible for sampling.

Samples drawn from individual bags should be observed and compared by the inspector or sampler to see that the lot being sampled is uniform in quality. In case it shall appear that a material portion of a lot of beans is in any way distinctly inferior to the remainder of the lot a separate sample should be drawn from each portion. The estimated amount in each portion should be ascertained and such portions treated as separate lots.

**Bean trier (probe).**—For use in obtaining a representative sample of beans the triers (probes) shown in Figure 1, A and B, are recommended. The trier shown in Figure 1A is especially recommended where excess moisture is suspected. The use of such a trier makes it possible to obtain beans from the center and the full length of each individual bag sampled. Inasmuch as the beans in the center of the bag may contain a higher percentage of moisture than those nearer the surface, a sample drawn in this manner should be more nearly representative of the lot.

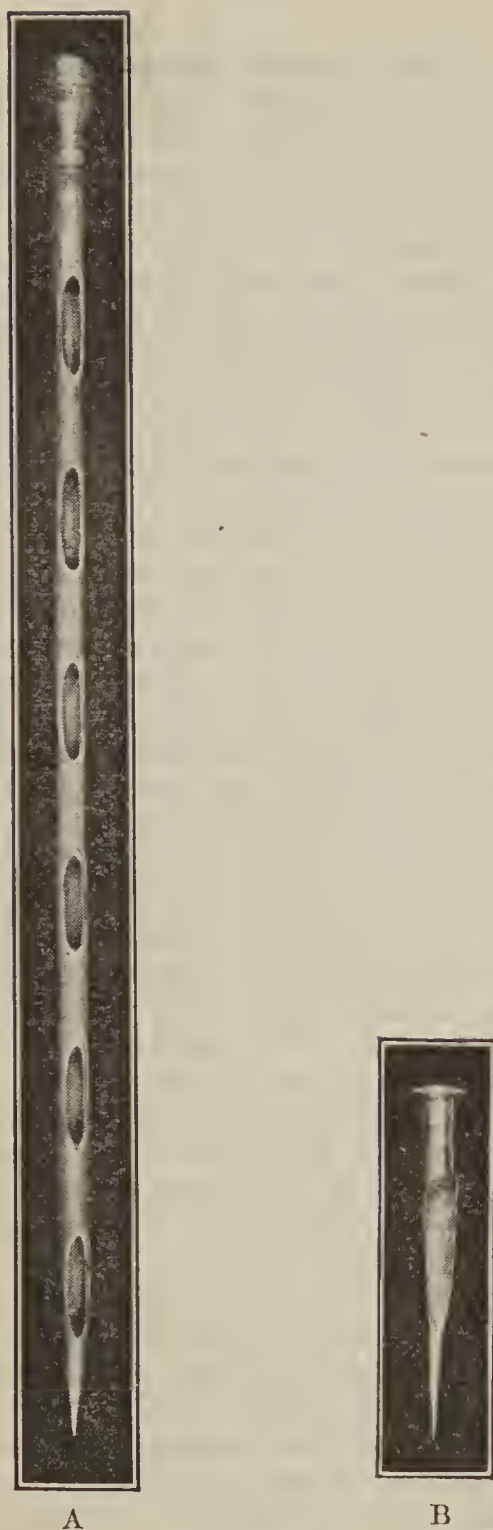


FIG. 1.—Bean triers (probes). A, double-tubed trier about 39 inches long, 1 inch outside diameter, for use in probing bags lengthwise through the center. B, short needle-point trier 9 inches long

In lots of beans where moisture is not likely to be a grade-determining factor the trier shown as Figure 1B will give satisfactory results in sampling. In using this type of trier the inspector or sampler should probe alternately the top and bottom of the bags.

**Appeal inspection.**—An appeal from an original inspection may be taken at any time if the quality or condition of the beans have not undergone a material change since the original inspection, if the reasons for the appeal are not irrelevant or unsubstantial, and the regulations of the Secretary of Agriculture have been complied with otherwise. An appeal inspection is never made by the inspector who made the original inspection from which the appeal was taken but is made by an inspector designated specifically for that purpose by the Chief of the Bureau of Agricultural Economics. The result of this arrangement is that in practically every appeal the determination of all factors which affect the grade of the beans is made by a Federal supervising inspector. An appeal inspection certificate gives a clear statement of the quality and condition of the beans in the lot and specifically refers to all previous certificates superseded by it. When an appeal inspection can not be obtained because of a change in quality or condition of the beans involved an additional inspection may be had to determine the effect of such changes. An additional inspection also may be obtained at any time for the purpose of providing an up-to-date certificate.

**Who receives certificates.**—The original of any form of Federal bean-inspection certificate is always delivered to the person who makes application for the inspection. Not more than three copies may be issued to the applicant without extra charge. Additional copies may be obtained by the applicant or other financially interested parties upon the payment of a small fee. The inspector who makes the inspection



retains a copy for his files and sends a copy to the supervising inspector in his district or to the Washington office as directed. Copies of appeal inspection certificates are sent to all interested parties, if known, except the carriers, and to such carriers as have been applicants for previous inspections.

**Fees and charges.**—The Secretary of Agriculture authorizes certain fees and charges to be collected for the work of Federal inspectors. These vary somewhat at different points, depending upon the volume of business at the point involved, the accessibility of localities where inspections ordinarily are made, and other factors. The fees are the amounts charged for the actual work of making the inspections and appeal inspections and the charges cover amounts which inspectors are permitted to charge for their time, travel, and other necessary expenses when making inspections at points away from their regular stations. These are usually in accordance with the schedule in the regulations of the Secretary of Agriculture, but in some cases special schedules which vary somewhat have been approved at points where unusual conditions justified them.

**How to obtain inspection.**—Any person who has a financial interest in a lot of beans and who desires to obtain inspection of the lot should make application for inspection to any Federal bean inspector. If there is no local inspector or if the location of an inspector is not known, application should be made direct to the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C. Applications made in this way will be referred to the nearest inspector in the field for attention or will be handled direct by Washington office. Anyone who wishes inspection of all beans which are shipped or received by him should file an application to that effect in a similar manner.

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